

A CASE-CONTROL STUDY OF GLIOMAS AND RESIDENCY WITHIN COUNTIES OF POTENTIAL ELEVATED RADON

Juliana F.M. Lewis, *University of Illinois at Chicago, United States of America*

Serap Erdal, *University of Illinois at Chicago, United States of America*

Bridget J. McCarthy, *University of Illinois at Chicago, United States of America*

Dora Il'yasova, *Duke University Medical Center, United States of America*

Darell D. Bigner, *Duke University Medical Center, United States of America*

Faith G. Davis, *University of Illinois at Chicago, United States of America*

Background and Aims: The only established environmental risk factor for brain tumors is ionizing radiation. Radon gas is the chief source of natural background ionizing radiation humans encounter. We aimed to assess the association between potential radon levels within residential counties and the risk for gliomas.

Methods: A case-control study, conducted between 2005 and 2009, included 505 cases and 811 hospital controls recruited from the NorthShore University Health System (Illinois) and the Duke University Medical Center (North Carolina) (National Cancer Institute Grant P50 CA108786-01). This study population represented twenty-eight states in the mid-west and southern United States. Residential counties were linked to potential radon levels from the U.S. Environmental Protection Agency's (EPA) Map of Radon Zones using geographic information systems. The EPA determined these levels with five factors: indoor radon measurements, geology, aerial radioactivity, soil permeability and foundation type of structures. Logistic regression analyses, adjusted for age and gender, were completed to estimate odds ratios (OR) and 95% confidence intervals (CI).

Results: Living within a county where potential radon was high or moderate (≥ 2 pCi/L (pico Curies per Liter)) versus low (< 2 pCi/L) resulted in an OR of 2.3 (95% CI: 1.9–2.9). Living within a county where potential radon was high (> 4 pCi/L) versus low (< 2 pCi/L) resulted in an OR of 5.6 (95% CI: 3.9–8.2).

Conclusions: To conclude, there is evidence in these data of an association between potential elevated radon and gliomas although usage of the EPA Map is limited as a substitute for personal exposure.